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**Polprevodniški elementi - Diskretni elementi - 5-5. del: Optoelektronske naprave - Optični sklopniki (IEC 60747-5-5:2007)**

Semiconductor devices - Discrete devices - Part 5-5: Optoelectronic devices - Photocouplers (IEC 60747-5-5:2007)

Halbleiterbauelemente - Einzel-Halbleiterbauelemente - Teil 5-5: Optoelektronische Bauelemente - Optokoppler (IEC 60747-5-5:2007)

Dispositifs à semiconducteurs - Dispositifs discrets - Partie 5-5: Dispositifs optoélectroniques - Photocoupleurs (CEI 60747-5-5:2007)

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**Ta slovenski standard je istoveten z: EN 60747-5-5:2011**

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**ICS:**

31.080.01	Polprevodniški elementi (naprave) na splošno	Semiconductor devices in general
31.260	Optoelektronika, laserska oprema	Optoelectronics. Laser equipment

**SIST EN 60747-5-5:2011**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60747-5-5**

February 2011

ICS 31.080.01; 31.260

English version

**Semiconductor devices -  
Discrete devices -  
Part 5-5: Optoelectronic devices -  
Photocouplers  
(IEC 60747-5-5:2007)**

Dispositifs à semiconducteurs -  
Dispositifs discrets -  
Partie 5-5: Dispositifs optoélectroniques -  
Photocoupleurs  
(CEI 60747-5-5:2007)

Halbleiterbauelemente -  
Einzel-Halbleiterbauelemente -  
Teil 5-5: Optoelektronische Bauelemente -  
Optokoppler  
(IEC 60747-5-5:2007)

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This European Standard was approved by CENELEC on 2011-01-02. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 47E/332/FDIS, future edition 1 of IEC 60747-5-5, prepared by SC 47E, Discrete semiconductor devices, of IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60747-5-5 on 2011-01-02.

This EN 60747-5-5:2011 replaces the clauses for photocouplers (or optocouplers) described in EN 60747-5-1, EN 60747-5-2 and EN 60747-5-3, including their amendments.

The contents for phototransistors and photothyristors in EN 60747-5-1, EN 60747-5-2 and EN 60747-5-3, including their amendments, will be considered obsolete as of the effective date of publication of this standard.

NOTE Photocouplers that are certified to the previous version of the photocoupler standard, namely EN 60747-5-1/2/3, should be considered in compliance with the requirements and provisions of EN 60747-5-5.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2012-01-02
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2014-01-02

Annex ZA has been added by CENELEC.

[SIST EN 60747-5-5:2011](https://standards.iteh.ai/catalog/standards/sist/ba37f412-d7f5-4462-8936-576b7-2062cf/sist-en-60747-5-5-2011)  
<https://standards.iteh.ai/catalog/standards/sist/ba37f412-d7f5-4462-8936-576b7-2062cf/sist-en-60747-5-5-2011>  
**Endorsement notice**

The text of the International Standard IEC 60747-5-5:2007 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60270:2000	NOTE	Harmonized as EN 60270:2001 (not modified).
IEC 60747-5-1:1997	NOTE	Harmonized as EN 60747-5-1:2001 (not modified).
IEC 60747-5-2:1997	NOTE	Harmonized as EN 60747-5-2:2001 (not modified).
IEC 60747-5-3:1997	NOTE	Harmonized as EN 60747-5-3:2001 (not modified).

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60065 (mod)	2001	Audio, video and similar electronic apparatus - Safety requirements	EN 60065 + corr. August + A11	2002 2007 2008
IEC 60068-1	1988	Environmental testing - Part 1: General and guidance	EN 60068-1 <sup>1)</sup>	1994
IEC 60068-2-1	2007	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	2007
IEC 60068-2-2	2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	2007
IEC 60068-2-6	2007	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	2008
IEC 60068-2-14	1984	Environmental testing - Part 2: Tests - Test N: Change of temperature	EN 60068-2-14 <sup>2) 3)</sup>	1999
IEC 60068-2-17	1994	Environmental testing - Part 2: Tests - Test Q: Sealing	EN 60068-2-17	1994
IEC 60068-2-27	2008	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	2009
IEC 60068-2-30	2005	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	2005
IEC 60068-2-58	2004	Environmental testing - Part 2-58: Tests - Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)	EN 60068-2-58 + corr. December	2004 2004
IEC 60068-2-78	2001	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2001

<sup>1)</sup> EN 60068-1 includes A1 to IEC 60068-1 + corr. October 1988.

<sup>2)</sup> EN 60068-2-14 includes A1 to IEC 60068-2-14.

<sup>3)</sup> EN 60068-2-14 is superseded by EN 60068-2-14:2009, which is based on IEC 60068-2-14:2009.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60112	2003	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003
IEC 60216-1	2001	Electrical insulating materials - Properties of thermal endurance - Part 1: Ageing procedures and evaluation of test results	EN 60216-1	2001
IEC 60216-2	2005	Electrical insulating materials - Thermal endurance properties - Part 2: Determination of thermal endurance properties of electrical insulating materials - Choice of test criteria	EN 60216-2	2005
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60672-2	1999	Ceramic and glass insulating materials - Part 2: Methods of test	EN 60672-2	2000
IEC 60695-11-5	2004	Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance	EN 60695-11-5	2005

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<https://standards.iteh.ai/catalog/standards/sist/ba37f412-d7f5-4462-8936-576b2c2062cf/sist-en-60747-5-5-2011>



IEC 60747-5-5

Edition 1.0 2007-09

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Semiconductor devices – Discrete devices –  
Part 5-5: Optoelectronic devices – Photocouplers**  
(standards.iteh.ai)

**Dispositifs à semiconducteurs – Dispositifs discrets –  
Partie 5-5: Dispositifs optoélectroniques – Photocoupleurs**  
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INTERNATIONAL  
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INTERNATIONALE

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SEMICONDUCTOR DEVICES –  
DISCRETE DEVICES –****Part 5-5: Optoelectronic devices –  
Photocouplers**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60747-5-5 has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices.

This standard replaces the clauses for photocouplers (or optocouplers) described in IEC 60747-5-1, IEC 60747-5-2 and IEC 60747-5-3, including their amendments.

The contents for phototransistors and photothyristors in IEC 60747-5-1, IEC 60747-5-2 and IEC 60747-5-3, including their amendments, will be considered obsolete as of the effective date of publication of this standard.

NOTE Photocouplers that are certified to the previous version of the photocoupler standard, namely IEC 60747-5-1/2/3, are to be considered in compliance with the requirements and provisions of IEC 60747-5-5.

The text of this standard is based on the following documents:

FDIS	Report on voting
47E/332/FDIS	47E/340/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of the parts in the IEC 60747 series, under the general title *Semiconductor devices – Discrete devices*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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[SIST EN 60747-5-5:2011](https://standards.iteh.ai/catalog/standards/sist/ba37f412-d7f5-4462-8936-576b2c2062cf/sist-en-60747-5-5-2011)

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## SEMICONDUCTOR DEVICES – DISCRETE DEVICES –

### Part 5-5: Optoelectronic devices – Photocouplers

#### 1 Scope

This part of IEC 60747 gives the terminology, essential ratings, characteristics, safety tests as well as the measuring methods for photocouplers (or optocouplers).

NOTE The word “optocoupler” can also be used instead of “photocoupler”.

#### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60065:2001, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1:2007, *Environmental testing – Part 2: Tests – Tests A: Cold*

IEC 60068-2-2:2007, *Environmental testing – Part 2: Tests – Tests B: Dry heat*

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60068-2-6:—, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)<sup>1</sup>*

IEC 60068-2-14:1984, *Environmental testing – Part 2: Tests – Test N: Change of temperature*

IEC 60068-2-17:1994, *Basic environmental testing procedures – Part 2: Tests – Test Q: Sealing*

IEC 60068-2-27:—, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock and bump<sup>2</sup>*

IEC 60068-2-30:2005, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-58:2005, *Environmental testing – Part 2-58: Tests – Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)*

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

<sup>1</sup> To be published (replacing the sixth edition)

<sup>2</sup> To be published (replacing the third edition)

IEC 60216-1:2001, *Electrical insulating materials – Properties of thermal endurance – Part 1: Ageing procedures and evaluation of test results*

IEC 60216-2:2005, *Electrical insulating materials – Thermal endurance properties – Part 2: Determination of thermal endurance properties of electrical insulating materials – Choice of test criteria*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60672-2:1999, *Ceramic and glass insulating materials – Part 2: Methods of test*

IEC 60695-11-5:2004, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

### 3 Photocoupler

Optoelectronic device designed for the transfer of the electrical signals by utilizing optical radiation to provide coupling with electrical isolation between the input and the output

NOTE Different types of photocouplers include ambient-rated or case-rated photocouplers, for signal-isolation applications.

#### 3.1 Semiconductor material

- Input diode: Gallium Arsenide, Gallium Aluminium Arsenide, etc.
- Output: Silicon, etc.

#### 3.2 Details of outline and encapsulation

##### 3.2.1 IEC and/or national reference number of the outline drawing

##### 3.2.2 Method of encapsulation: glass/metal/plastic/other

##### 3.2.3 Terminal identification and indication of any connection between a terminal and the case

#### 3.3 Type of photocouplers

##### 3.3.1 DC input photocoupler

Photocoupler consisting at the input of a photoemitter to which d.c. current is applied

##### 3.3.2 AC input photocoupler

Photocoupler consisting at the input of antiparallel photoemitters to which a.c. current is applied

##### 3.3.3 Phototransistor photocoupler

Photocoupler whose photo sensitive element is a phototransistor

NOTE Phototransistor is a transistor in which the current produced by the photoelectric effect in the neighbourhood of the emitter-base junction acts as base current, which is amplified.

##### 3.3.4 Photodarlington photocoupler

Photocoupler whose photo sensitive element is a Darlington phototransistor

NOTE A base terminal may or may not be provided.

##### 3.3.5 Photothyristor photocoupler

Photocoupler whose photo sensitive element is a photothyristor

NOTE 1 Photothyristor is a thyristor that is designed to be triggered by optical radiation.

NOTE 2 Gate terminal may or may not be provided.